

the slides investigated, but it was again a hurried journey. The next year with the assistance of L. E. Daniels the work was thorough.

Oct. 17th, a month and a half from Tucson, the collector, snails, snakes and ferns were on the train homeward bound, and Cole wending his way over the toll road Tucson-ward. Theodore, that splendid thirty-dollar horse, and also one of Cole's, ate too much of a dry, short, delicate, mischievous grass, and died at the end of the trip.

A NEW OPISTHOSIPHON FROM CUBA.

BY WILLIAM F. CLAPP.

Opisthosiphon berryi sp. nov. Plate VII, fig. 14.

Shell longitudinally, finely plicate, ochraceous buff, encircled with a broad chocolate-brown band on the periphery of the last whorl and on the lower half of the earlier whorls; slightly shining; decollated; suture deep, crenate; four or five spiral ridges appearing in the umbilical region; whorls (remaining) four, very convex; aperture vertical, circularly oval, peristome white, double; the inner, a brief continuation of the whorl; the outer, on the right side, smooth, slightly expanded, at the suture broadly expanded and excavated over the breathing tube, adnate to the penultimate whorl; columellar margin expanded horizontally above in a broad flange adnate to the penultimate whorl, a large lobe curving over and nearly covering the umbilical region, interrupted below by a broad sinus where the lip is abruptly reflexed and attached to the whorl, a smaller lobe expanded horizontally below. A minute breathing hole within the aperture near the posterior angle, connects with a tube, somewhat concealed in the expanded and excavated lip, which curving back to the suture, descends and ends in the narrow space between the ultimate and penultimate whorls. Numerous strong raised lamellae mostly originating on the inner lip but occasionally extending along the parietal lip, cover that portion of the tube visible within the lip. Operculum as in *Opisthosiphon pupoides*.

Length (type) 13.5 mm. *g.d.* 9 mm. *l.d.* 7.3 mm. *g.d. aperture* 4.7 mm. *l.d.* 4 mm.

Length (paratype) 14.5 mm. *g.d.* 9.7 mm. *l.d.* 7.5 mm. *g.d. aperture* 5.5 mm. *l.d.* 4.3 mm.

Collected by Dr. S. S. Berry, March 1, 1814, at Cariji, Cerro de Tuabaquey, Prov. Camaguey, Cuba.

Type M. C. Z. No. 42005; Paratype, collection of Dr. S. S. Berry.

The chocolate-colored band is the most striking character of *Opisthosiphon berryi*. Compared with *O. pupoides* Mor. it has more convex whorls, more numerous and finer plicae, the outer lip is smooth, much less broadly expanded below and over the breathing tube is bent forward rather than being reflected back, as in *O. pupoides*. The columellar lip does not completely cover the umbilicus, as in *pupoides*, and its two lobes are much more widely separated. The operculum is very similar to *O. pupoides*, differing only in being slightly more oval. In the larger specimen very faint traces of fine chestnut-colored widely interrupted spiral bands may be seen on the upper half of each whorl, very similar in arrangement and color to those seen in *O. pupoides*. A young specimen shows the embryonic shell to consist of about $1\frac{1}{2}$ smooth whorls, the brown band and longitudinal plicae beginning at about the second whorl, the plicae becoming gradually more numerous and the intervening spaces less wide.

I am indebted to Mr. Berry for the opportunity to examine this species. It is closely related to *Opisthosiphon pupoides* Morelet from the Isle of Pines. The similarity of the shell fauna of Camaguey, Santa Clara, and the Isle of Pines, has been noted by Mr. John B. Henderson (NAUT., Vol. 27, p. 137; NAUT., Vol. 29, p. 18). Mr. Henderson also calls attention to the confusion in the genera of the Cyclostomatidae.

The species described above belong to *Opisthosiphon*, Dall (Proc. Mal. Soc. Lond., 1905, p. 209). Shells which possess the operculum of a *Rhytidopoma* and in addition are provided with a tubular projection behind the outer lip belong here. Undoubtedly when all of the characters of the species placed in this group are known, it will be found to be a natural one, and

yet it is true that the value for showing relationships, of accessory breathing apparatus among the land operculates, is to be questioned. The necessity for obtaining air when the aperture is tightly sealed with the operculum has apparently caused many genera not at all closely related to develop ingenious and occasionally somewhat similar breathing contrivances. Species of *Pterocyclos*, *Spiraculum*, *Rhiostoma* and *Tomocyclos*, while not closely related to our American land operculates have developed breathing apparatus similar to that of some of the American species. The American shells belonging to the Eriiciidae, the genera of which are founded to a great extent on the characters of the operculum, show great variation in the apparatus through which air is introduced into the lumen of the whorl when the aperture is closed by the operculum. At least three types of accessory breathing apparatus may be seen.

First. With perforation connecting with visible external tube.

a. Operculum of *Rhytidopoma*.

1. Tube greatly prolonged, entering umbilicus.

Opisthosiphon rugulosum Pfr. Matanzas.

Opisthosiphon denegatum Poey. Isle of Pines.

2. Tube short, external opening towards and close to preceding whorl.

Opisthosiphon bahamense Sh. Bahamas.

3. Tube short, disappearing in the suture between the ultimate and penultimate whorl.

Opisthosiphon pupoides Mor. Isle of Pines.

4. Tube short, straight, not recurved.

Opisthosiphon sculptum Gundl. Cabo Cruz.

b. Operculum of *Choanopoma*.

1. Tube as in *Opisthosiphon pupoides* Mor.

Choanopoma uncinatum Arango. Sta. Clara, Cuba.

Second. With perforation opening directly into umbilical region or exterior of shell.

a. Operculum of *Choanopoma*.

Choanopoma blaini Gundl. Galalon, Cuba.

b. With operculum of *Cistula*.

Cistula limbifera Mke. Matanzas.

c. With operculum of *Chondropoma*.

Chondropoma egregium Gundl. Pinar del Rio, Cuba.

d. With operculum unknown.

Licina percrassa Wright. Pinar del Rio.

Third. With perforation not penetrating to exterior of whorl but connecting with an internal air space which is situated in the upper angle of the whorl and extends back from the aperture for a considerable distance. In some specimens it may be traced for over two whorls.

Rhytidopoma bilabiatum Orb. Pinar del Rio.

The first group has a restricted geographical distribution extending from the Bahamas through central Cuba to the Isle of Pines. *Choanopoma uncinatum* Arango while possessing the typical Opisthosiphon breathing tube has the very different operculum of a Choanopoma. It therefore cannot be included in Opisthosiphon, and until a careful study of the animal shows its true relationships may be retained as an aberrant Choanopoma.

The second group is confined to western Cuba and while containing species with very different opercula, and therefore a group of apparently no systematic value, is nevertheless interesting, in that it is confined almost entirely to Pinar del Rio, and entirely to western Cuba.

The third group, of which I have seen but one species, is of interest because of the fact that in this case the perforation and internal tube appear to be of no practical value; for, though one might be led to expect that at certain stages of growth, communication to the exterior might exist through the external sutural flanges, I have been unable to find any structural evidence of such connection.

It would appear from the above that if the breathing tube is to be considered of value as a generic character together with the operculum, as in the case of Opisthosiphon, *Choanopoma uncinatum* Arango would have to be placed in a new genus, the operculum being very different from that of Opisthosiphon; while the breathing tube, having been considered of sufficient

importance to separate *Opisthosiphon* from *Rhytidopoma*, would also have the same consideration in separating *C. uncinatum* from *Choanopoma*.

It would also seem that if the breathing tube restricted for *Opisthosiphon* is of generic importance that the modified perforation seen in so many of the *Ericiidae* from western Cuba should also be considered of value generically. This would mean, providing that the operculum was still considered of generic value, the removal of species of *Choanopoma*, of *Cistula* and of a large number of *Chondropoma* to new genera.

This would merely be substituting chaos for confusion and, until the anatomy of many of the species has been carefully examined, it would seem better to merely call attention to the peculiarly restricted distribution of those species of the *Ericiidae*, which have made structural changes in the shell, probably, as Dr. Dall suggests (*Proc. Mal. Soc. Lond.*, 1905, p. 309) to enable them to obtain air when the aperture is closed by the operculum.

SOME MARINE MOLLUSCA ABOUT NEW YORK CITY.

BY ARTHUR JACOT.

To aid any New-Yorkers interested in the shells of their vicinity, I am taking this opportunity of giving them the results of a few studies which were made during the past year in that region.

The coast of Staten Island from Fort Wadsworth to Great Kills was carefully gone over at low tide several times. Along this strip are three definite stations. The first (1) is an expanse of red sand flats (exposed only at low tide) at the mouth of the stream which drains the marshland between South and Midland Beaches. This is the only place where I found *Periploma leanum*, *Pandora gouldiana* and *Lyonsia hyalina*. Another station (2) opposite the Oakwood Heights station on the steam railroad to Totenville, is a "sod-bank" formation, beautifully showing the encroachment of the sea on